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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,268	07/09/2004	Tearney J. Guillermo	A36290 PCT USA 069225.016	7475
30873	7590	04/19/2006	EXAMINER ANDERSON, DENISE BROWN	
DORSEY & WHITNEY LLP INTELLECTUAL PROPERTY DEPARTMENT 250 PARK AVENUE NEW YORK, NY 10177			ART UNIT 2877	PAPER NUMBER

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/501,268

Applicant(s)

GUILLERMO ET AL.

Examiner

Denise B. Anderson

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 48-97 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 48-97 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10 IDS's</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

Receipt is acknowledged of the information disclosure statements 7/9/04, 4/25/05, 8/15/05, 10/5/05, 10/31/05, 11/9/05, 12/13/05, 1/17/06, 2/21/06, and 3/17/06, which information has been considered and entered into the application. The information disclosure statements received have been placed in the application file, and the information referred to therein has been considered as to the merits. See the attached forms PTO-1449 (69 sheets).

The numerous references and materials listed on the submitted 69 sheets of the IDS's make it difficult to determine whether or not any of the references, or parts of the references, are material to applicants' claimed invention. It is noted that applicants, in their several IDS submissions, do not indicate any particular reference or parts of references which they deem "material" to the patentability of the pending claims under 37 CFR 1.56(b).

Applicants are reminded of the standard set forth in the leading inequitable conduct case of *J.P. Stevens & Co. v. Lex Tex Ltd.*, 747 F.2d 1553, 223 USPQ 1089 (Nov. 9, 1984), *cert. denied*, 106 S.Ct. 73 (1985): Where none of the prior art cited during prosecution teaches a key element of the claim(s) and where a reference known to the applicants) does, the applicants) should know that reference is material. Thus, if applicants are aware of any cited reference from among the information disclosures of 7/9/04, 4/25/05, 8/15/05, 10/5/05, 10/31/05, 11/9/05, 12/13/05, 1/17/06, 2/21/06, or

Art Unit: 2877

3/17/06 that are "material," applicants should make that reference known to the examiner.

It is also noted that a "misrepresentation is material if it makes it impossible for the Patent Office fairly to assess [the patent] application against the prevailing statutory criteria." *In re Multidistrict-Litig. Involving Forst Patent*, 540 F.2d 601, 604, 191 USPQ 241, 243 (3d Cir. 1976); see also *Monsanto Co. v. Rohm & Haas Co.*, 456 F.2d 592, 600, 172 USPQ 323, 329 (3d Cir.), *cert. denied*, 407 U.S. 934, 174 USPQ 129 (1972). And, the submission of voluminous documents in the instant information disclosure statements (here, in excess of 69 sheets) make it difficult, and likely impossible, for the Patent Office to fairly assess applicants' application against the prevailing statutory criteria.

Drawings

Figures 1, 2, 3, and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 48, 62, 70 and 84 are objected to because of the following informalities: each of the claims uses the word "inferomteric". Examiner interprets that applicant intended to use the word "interferometric".

Claims 56 and 69 are objected to because of the following informalities: the phrase "adapted to cooperated with" does not constitute a complete thought. Examiner interprets that applicant intended to use the term "cooperate" instead of "cooperated".

Claim 68 is objected to because of the following informalities: there is insufficient antecedent basis for the phrase "the translation" and "the at least one". Examiner suggests replaces the word "the" with "a" (before the word "translation) and deleting the word "the" before the word "at".. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 54, 76, and 90 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Examiner cannot locate in the specification or drawings where applicant describes the use of a hologram. It cannot be determined how applicant is using a hologram to add to his invention or exactly where the hologram is located with

Art Unit: 2877

respect to the other structural limitations of the invention. For example, in figure 9, applicant shows an apodizer, and separately, in figure 8, applicant shows a diffractive element. However, applicant does not show an apodizer and diffractive element in combination with a hologram.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 48-97 are rejected.

Claims 48-53, 55-75, 77-89, and 91-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii et al (USPN 6,687,010 B1), and further in view of Erdelyi et al (J. Vac. Sci. Technol. B 15(2), Mar/Apr 1997, p. 287-292).

As to claims 48, 62, 70, and 84, Horii et al discloses, in figures 2 and 75, a first interferometric arrangement providing electro-magnetic radiation (low coherence light source 1); a second arrangement (scanning probe 20) configured to receive the electromagnetic radiation from source 1; configured to generate an intensity distribution (detectors 238 or 17 and 18 measure intensity and send signals to the signal processing or computer 27 and a monitor 28 displays the tomographic image of the object. Horii further discloses in the nineteenth embodiment (columns 58 and 59) the generation of quasi non-diffracting light (column 58, lines 59-66) with an axicon lens. Horii et al does not expressly disclose that the intensity distribution is approximately constant for a

Art Unit: 2877

predetermined distance. Erdelyi discloses the generation of non-diffracting Bessel beams (page 287, right column, 2nd paragraph, lines 1+) with an intensity distribution shown in figure 5. The intensity distribution shows that the central peak (representing a first section of the intensity distribution) has a defined constant intensity over a small radius (horizontally plotted in the figure). The second peak (representing a second section of the intensity distribution) also has a defined radius over which the intensity is constant. Horii et al and Erdelyi et al are analogous art because they are from similar problem solving areas. It would have been obvious to one of ordinary skill in the art at the time of the invention to generate an intensity distribution like the one shown in Erdelyi et al with the axicon or annulus probe structure of Horii et al for the purpose of showing a significant increase in the depth of focus while simultaneously enhancing the transverse resolution (as described in Erdelyi et al on page 287, right column, 2nd paragraph and as described in Horii et al (column 59, lines 7-12).

As to claims 49, 71, and 85, Horii et al discloses, in figures 2 and 75, Horii et al discloses a second arrangement configured for optically imaging the sample (probe 20 and sample 162) adapted so that an image of sample 162 is displayed on monitor 28.

As to claims 50, 72, and 86, Horii et al discloses, in figure 73, an axicon lens configured with the sample probe.

As to claims 51, 52, 73, 74, 87 and 88, Horii et al discloses, in figure 72, an annular slit 308, which is a ring-like structure and a diffractive optical element.

As to claims 53, 64, 75, and 89, Horii et al discloses, in figure 72, an annular slit 308 (a diffractive element) in combination with a plurality of lens (304,305).

As to claims 55, 60, 67, 77, 82, 91 and 96, Horii et al discloses, quasi non-diffracted light (column 58, lines 38-66) from an annular aperture 308 (figure 72). Horii et al does not expressly disclose that the intensity distribution of the light is a Bessel function (i.e., a non-Gaussian distribution). Erdelyi et al discloses that more than a century ago, a very narrow annular aperture can be described by a Bessel function (page 287, right column, 1st paragraph). It would have been obvious to one of ordinary skill in the art at the time of the invention to represent the intensity distribution for the quasi non-diffracting light of Horii et al with the Bessel function described in Erdelyi et al for the purpose of enhancing the depth of focus.

As to claims 56, 57, 68, 69, 78, 79, 92, and 93, Horii et al discloses a third arrangement for generating 2-D imaging – a scanning mechanism enables scanning in both the lateral and depth direction (column 60, lines 12-15), and images can be seen on monitor 28 in figure 75.

As to claims 61, 83, and 97, Horii et al discloses, in figure 75, a fourth arrangement for displaying a 2-D imaging (monitor 28 receives intensity data from detector 238).

As to claims 58, 66, 80, and 94, Horii et al discloses, in figures 2 and 75, the generation of an intensity distribution (detectors 238 or 17 and 18 measure intensity and send signals to the signal processing or computer 27 and a monitor 28 displays the tomographic image of the object. Horii et al does not expressly disclose the specific full-width at half maximum (FWHM) of 10 microns for the intensity distribution. Erdelyi et al discloses a FWHM and it's relationship to the resolving power of the system (page 290,

Art Unit: 2877

right column, Section B., 2nd paragraph). It would have been obvious to one of ordinary skill in the art at the time of the invention to generate the appropriate FWHM as described by Erdelyi et al with the axicon lens or annular slit or diffraction grating used for generating the intensity distribution in Horii et al for the purpose of obtaining the appropriate resolving power (noting the trade-off between depth of focus and transverse resolution). Furthermore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to experimentally determine the FWHM, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to claims 59, 81, and 95, Horii et al discloses, in figures 2 and 75, the generation of an intensity distribution (detectors 238 or 17 and 18 measure intensity and send signals to the signal processing or computer 27 and a monitor 28 displays the tomographic image of the object. Horii et al does not expressly disclose that the intensity distribution is approximately constant for a predetermined distance of 50 microns. Erdelyi discloses the generation of non-diffracting Bessel beams (page 287, right column, 2nd paragraph, lines 1+) with an intensity distribution shown in figure 5. The intensity distribution shows that the central peak (representing a first section of the intensity distribution) has a defined constant intensity over a small radius (horizontally plotted in the figure), but the radius is not 50 microns. However, the distance over which the intensity is constant depends on the type of optical element(s) used to generate the intensity. Erdelyi et al uses an annular aperture and shows in figure 3 a distribution of 220 microns (and described in Section II. A. on page 288). It would have been obvious

Art Unit: 2877

to one of ordinary skill in the art at the time of the invention to generate the appropriate distance as described by Erdelyi et al with the axicon lens or annular slit or diffraction grating used for generating the intensity distribution in Horii et al for the purpose of obtaining the appropriate resolving power (noting the trade-off between depth of focus and transverse resolution). Furthermore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to experimentally determine the particular distance over which the intensity distribution is constant through trial and error experimentally, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to claims 63 and 65, Horii et al discloses, in figures 2 and 75, the generation of an intensity distribution (detectors 238 or 17 and 18 measure intensity and send signals to the signal processing or computer 27 and a monitor 28 displays the tomographic image of the object. Horii et al does not expressly disclose particular direction that is vertical (claim 63) or one section of the intensity distribution being above the other (claim 65). Erdelyi discloses the generation of non-diffracting Bessel beams (page 287, right column, 2nd paragraph, lines 1+) with an intensity distribution shown in figure 5. The intensity distribution shows that the central peak (representing a first section of the intensity distribution) has a defined constant intensity over a small radius (horizontally plotted in the figure). The second peak (representing a second section of the intensity distribution) also has a defined radius over which the intensity is constant. Moving in a vertical direction from the horizontal axis, in the center of the second peak,

(a correspondingly mirrored second peak would also be seen on the opposite side of the central peak) it can be seen that the width of the 2 peak sections are approximately the same and the central peak (section 1) is partially above the second peak section (as noted by their intensity values), as is typical of Bessel functions. It would have been obvious to one of ordinary skill in the art at the time of the invention to show constant widths along a particular direction and one section partially above another section of the intensity distribution as shown in Erdelyi et al, with the intensity distribution generated by Horii et al for the purpose of representing a Bessel function. See also rejection to claim 62 above.

Claims 54, 76, and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii et al (USPN 6,687,010 B1) and Erdelyi et al (J. Vac. Sci. Technol. B 15(2), Mar/Apr 1997, p. 287-292), and further in view of The General Hospital Corporation (GHC)/(WO 99/44089).

As to claims 54, 76, and 90, Horii et al discloses, in figures 2 and 75, Horii et al discloses a second arrangement configured for optically imaging the sample (probe 20 and sample 162) adapted so that an image of sample 162 is displayed on monitor 28. Horii et al further discloses, in figure 72, an annular slit 308, (a diffractive element) in combination with a plurality of lens (304,305) and generating quasi non-diffracted light (column 58, lines 38-66) from the annular slit 308 (figure 72). Horii et al does not expressly disclose the combination of the diffractive element and apodized lens joined with the hologram. GHC discloses, in figure 1, a grating (diffractive element 12) with a lens 14, which is configured for three-dimensional imaging. A hologram is a three-

Art Unit: 2877

dimensional image. It would have been obvious to one of ordinary skill in the art at the time of the invention to insert the probe components (diffraction grating and lens) into the probe arm of Horii et al (with the annular slit) for the purpose of more efficiently measuring the spectrum.

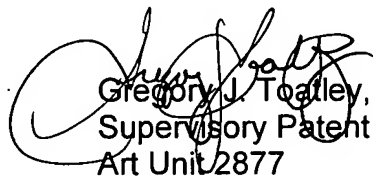
Fax/Telephone Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise B. Anderson whose telephone number is 571-272-8324. The examiner can normally be reached on Mon-Fri (9:30 AM - 6 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Denise B. Anderson, Ph.D.
Patent Examiner
Art Unit 2877


Gregory J. Toatley, Jr.
Supervisory Patent Examiner
Art Unit 2877

17 APR 06

DBA DBA
Date Signed: 4/17/06